

What is claimed is:

1. A frequency measuring apparatus comprising:

a voltage measuring part for measuring the voltage of an electric power system at timings which are obtained by equally dividing one period of a reference wave by $4N$ (N being a positive integer);

a chord length calculation part for calculating, at each of said $(4N + 1)$ timings, voltage vectors directed to points represented by complex numbers on a complex plane each consisting of a real part which is one of said voltages measured at a first timing comprising any of said $(4N + 1)$ timings, and an imaginary part which is a voltage measured at a second timing delayed by 90 electrical degrees from said first timing, said chord length calculation part further calculating, at each of said $(4N + 1)$ timings, the length of a cord connecting between a tip end of one of said voltage vectors calculated at a third timing comprising any of said $(4N + 1)$ timings and a tip end of another of said voltage vectors calculated at the last timing before said third timing;

a voltage root-mean-square value calculation part for calculating, at a fourth timing comprising each of said $(4N + 1)$ timings, a voltage root-mean-square value from those of said voltages which are measured at past $4N$ timings from said fourth timing and at said fourth timing;

a rotational phase angle calculation part for summing, at a fifth timing comprising each of said $(4N + 1)$ timings, those of said cord lengths which have been obtained at past $4N$ timings from said fifth timing and at said fifth timing, and calculating, based on a total sum of said cord lengths and said voltage root-mean-square value, a phase angle between one of said voltage vectors calculated at a sixth timing comprising any of said timings and another voltage vector calculated at a timing preceding said sixth timing by one period of said reference wave; and

a frequency calculation part for calculating the frequency of said electric power system from said phase angle thus calculated.

2. The frequency measuring device as set forth in claim 1, further comprising a root-mean-square value voltage averaging part for averaging, at

each of said $(4N + 1)$ timings, said calculated voltage root-mean-square value and at least one of those voltage root-mean-square values which have been calculated before the calculation of said voltage root-mean-square value to provide a voltage root-mean-square value.

3. The frequency measuring device as set forth in claim 1, further comprising a frequency averaging part for averaging, at each of said $(4N + 1)$ timings, said calculated frequency and at least one of frequencies of said electric power system which have been calculated before the calculation of said frequency, to provide the frequency of said electric power system.

4. The frequency measuring device as set forth in claim 1, wherein either one of a power system frequency stabilization control apparatus, a generator frequency protective apparatus or a power distribution system dispersed power source individual operation preventive apparatus is provided with said frequency measuring device.